

### 6.5.2.8 LP Alarm (F-024) Removal and Replacement (Figure 6-7).

#### a. Tools, Parts, Materials, and Test Equipment.

- (1) Wrench, open-end, 9/16"
- (2) Wrench, open-end, 11/16"
- (3) Wrench, open-end, 3/4"
- (4) Parts: See Chapter 7 for part numbers and CAGE codes
- (5) Silicone compound, MIL-S-8660

#### b. LP Alarm Removal.

- (1) Remove CPA IAW paragraph 6.5.2.1.
- (2) Using 11/16" wrench, loosen lower union nut (1) while holding LP alarm (2).
- (3) Remove alarm (2) with union (1).
- (4) Remove O-ring (3) from tee (4).
- (5) With LP alarm (2) on work table, hold alarm body with 3/4" wrench, and loosen union (1) with 9/16" wrench. Remove union.
- (6) Remove O-ring (5).

#### c. LP Alarm Replacement.

- (1) Install O-ring (5) on union (1). Install union (1) on alarm (2); hand-tighten.
- (2) Place LP alarm (2) on work table; hold body with 3/4" wrench and tighten union (1) with 9/16" wrench.
- (3) Install O-ring (3) in tee (4).
- (4) Situate alarm as shown in Figure 6-7, positioning LP alarm body beneath tube (6). Hand-tighten lower union nut (1) onto tee (4).
- (5) Grip LP alarm (2) and tube (6) and tighten lower union nut (1) with 11/16" wrench. Ensure alarm does not touch tube (6) or LP gauge isolation valve (ALP-V207).
- (6) Check to ensure tee (4) retaining nut is tight with 9/16" wrench and tube (7) nut is tight against tee (4) with 11/16" wrench.
- (7) Conduct system tightness test IAW paragraph 6.5.2.2, modified as follows:

- (a) Skip Step b.(13).

- (b) As Step 14 (bleeding down PASP) is being conducted, note pressure on HP gauge (AHP-G201).
- (c) As HP gauge pressure falls to 500 psig  $\pm$  50 psig, alarm should actuate. If alarm does not actuate, it is defective.
- (d) If alarm does not silence as HP air pressure increases above 1,000 psig (nominal), it is defective.

#### (8) Reinstall CPA IAW paragraph 6.5.2.1.

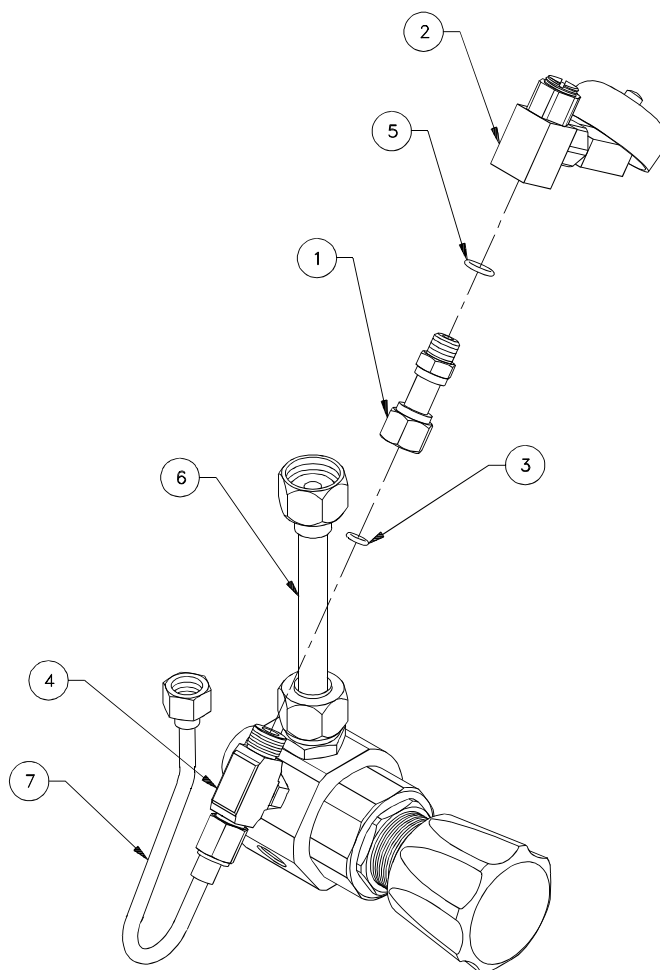


Figure 6-7. LP Alarm (F-024)

### 6.5.2.9 Regulator (AHP-V205) Removal and Replacement (Figure 6-8).

#### a. Tools, Parts, Materials, and Test Equipment.

- (1) Ratchet handle, 3/8" drive
- (2) Screwdriver, cross-tip, #2
- (3) Screwdriver, flat-tip, 1/8"
- (4) Socket, 1/2"
- (5) Wrench, open-end, 3/8"
- (6) Wrench, open-end, slim, 9/16"
- (7) Wrench, open-end, 11/16"
- (8) Wrench, open-end, 15/16"
- (9) Wrench, open-end, 1"
- (10) Wrench, open-end, 1-1/2"
- (11) Parts: See Chapter 7 for part numbers and CAGE codes
- (12) Silicone compound, MIL-S-8660

#### b. Regulator Removal.

- (1) Remove CPA IAW paragraph 6.5.2.1. Place CPA face down on work table.
- (2) Using 11/16" wrench, loosen tube (1) nuts and remove tube. Remove O-rings (2, 3).
- (3) Holding LP alarm (4), loosen and remove union (5) and alarm (together) using 11/16" wrench. Remove O-ring (6).
- (4) Using 11/16" wrench, loosen tube (7) nuts; remove tube from tee (8) and isolation valve. Remove O-rings (9,10).
- (5) Holding connector (11) with 15/16" wrench, loosen tube (12) upper nut with 1" wrench. Holding connector (13) with 15/16" wrench, loosen tube (12) lower nut with 1" wrench. Remove tube (12); remove both O-rings (14).
- (6) Using 15/16" wrench, remove connector (13) from regulator (15); remove O-ring (16).
- (7) Loosen tee (8) retaining nut using 9/16" wrench; unscrew tee from regulator. Remove O-ring (17).
- (8) Loosen elbow (18) retaining nut with 9/16" wrench; unscrew elbow from regulator. Remove O-ring (19).
- (9) Loosen connector (20) large nut with 1" wrench and slide tube nut back.

- (10) Loosen connector (20) small nut with 11/16" wrench. Do not unscrew.
- (11) Remove screws (21) with #2 cross-tip screwdriver, holding lock nuts (22) with 3/8" wrench. Remove bracket assembly (23) and regulator from CPA.
- (12) Remove O-ring (24) from elbow (25).
- (13) Remove connector (20) from regulator; remove O-ring (26).
- (14) With 1/8" flat-tip screwdriver, remove cap (27).
- (15) Using 3/8" ratchet handle and 1/2" socket, hold control knob and remove nut (28) from regulator stem.
- (16) Unscrew regulator handle (29) from regulator stem.
- (17) Using 1-1/2" wrench, remove mounting nut (30) and separate regulator bracket (23) from regulator.

#### **NOTE**

Do not remove relief remaining on back of regulator. Return regulator (with relief) to authorized maintenance facility for repair.

#### c. Regulator Replacement.

- (1) Install bracket (23) on regulator. Align center screw hole in bracket with inlet port on regulator. Install nut (30) and tighten with 1-1/2" wrench.
- (2) Install O-ring (16) on connector (13). Screw connector into regulator inlet port; hand-tighten.
- (3) Ensure tee (8) retaining nut is fully backed off of O-ring seating surface. Install O-ring (17) on tee (8). Screw tee into regulator port next to inlet adapter and hand-tighten. Orient tee parallel to back face of regulator and hand-tighten tee retaining nut.
- (4) Ensure elbow (18) retaining nut is fully backed off of O-ring seating surface. Install O-ring (19) on elbow (18). Screw elbow (18) into regulator port adjacent to tee; hand-tighten.
- (5) Install O-ring (26) on connector (20). Screw connector (20) into regulator; hand-tighten.

- (6) Install O-ring (24) in elbow (25) on back of LP manifold.
- (7) Place regulator (15) and bracket (23) on CPA so that inlet port is pointed toward three-way ball valve.
- (8) Screw connector (20) large nut onto elbow (25); hand-tighten.
- (9) Install three screws (21) and locknuts (22) using #2 cross-tip screwdriver and 3/8" wrench. Do not tighten.
- (10) Using 15/16" wrench, tighten connector (13) onto regulator.
- (11) Using 11/16" wrench, tighten connector (20) small nut onto regulator.
- (12) Install O-ring (6) on union (5). Hand-tighten union (5) nut onto tee (8), turning tee slightly, as required. Situate LP alarm (4) as shown in Figure 6-8, positioning alarm body beneath tube (12).
- (13) Install O-rings (9, 10) on tube (7). Install tube between HP gauge isolation valve and tee (8). Position tee slightly, as required; hand-tighten tube nuts.
- (14) Install both O-rings (14) on connector (11) and connector (13). Carefully install tube (12); hand-tighten tube nuts.
- (15) Holding connector (11) with 15/16" wrench, tighten tube (12) upper nut with 1" wrench. Holding connector (13) with 15/16" wrench, tighten tube (12) lower nut with 1" wrench.
- (16) Using 1" wrench, tighten connector (20) large nut.
- (17) Using 11/16" wrench, tighten tube (7) nuts (between HP isolation valve and tee (8)).
- (18) Grip LP alarm (4) and tube (12), and tighten union (5) nut with 11/16" wrench. Ensure alarm does not touch tube (12) or LP gauge isolation valve (ALP-V207).
- (19) Using 11/16" wrench, ensure tube (7) nut is tight against tee (8).
- (20) Using slim 9/16" wrench, tighten tee (8) retaining nut.
- (21) Install O-rings (2, 3) on tube (1). Install tube (1) assembly between LP gauge isolation valve and elbow (18), positioning elbow to accommodate tube. Hand-tighten tube nuts. Using 11/16" wrench, tighten tube nuts. Using slim 9/16" wrench, tighten elbow (18) retaining nut.
- (22) Using #2 cross-tip screwdriver and 3/8" wrench, tighten regulator bracket screws (21) and nuts (22).
- (23) Perform MRC 5519 A-1R (regulator control knob adjustment and regulator test).
- (24) Perform system tightness IAW paragraph 6.5.2.2, modified as follows: Skip Step b.(13).
- (25) Install CPA in PASP IAW paragraph 6.5.2.1.

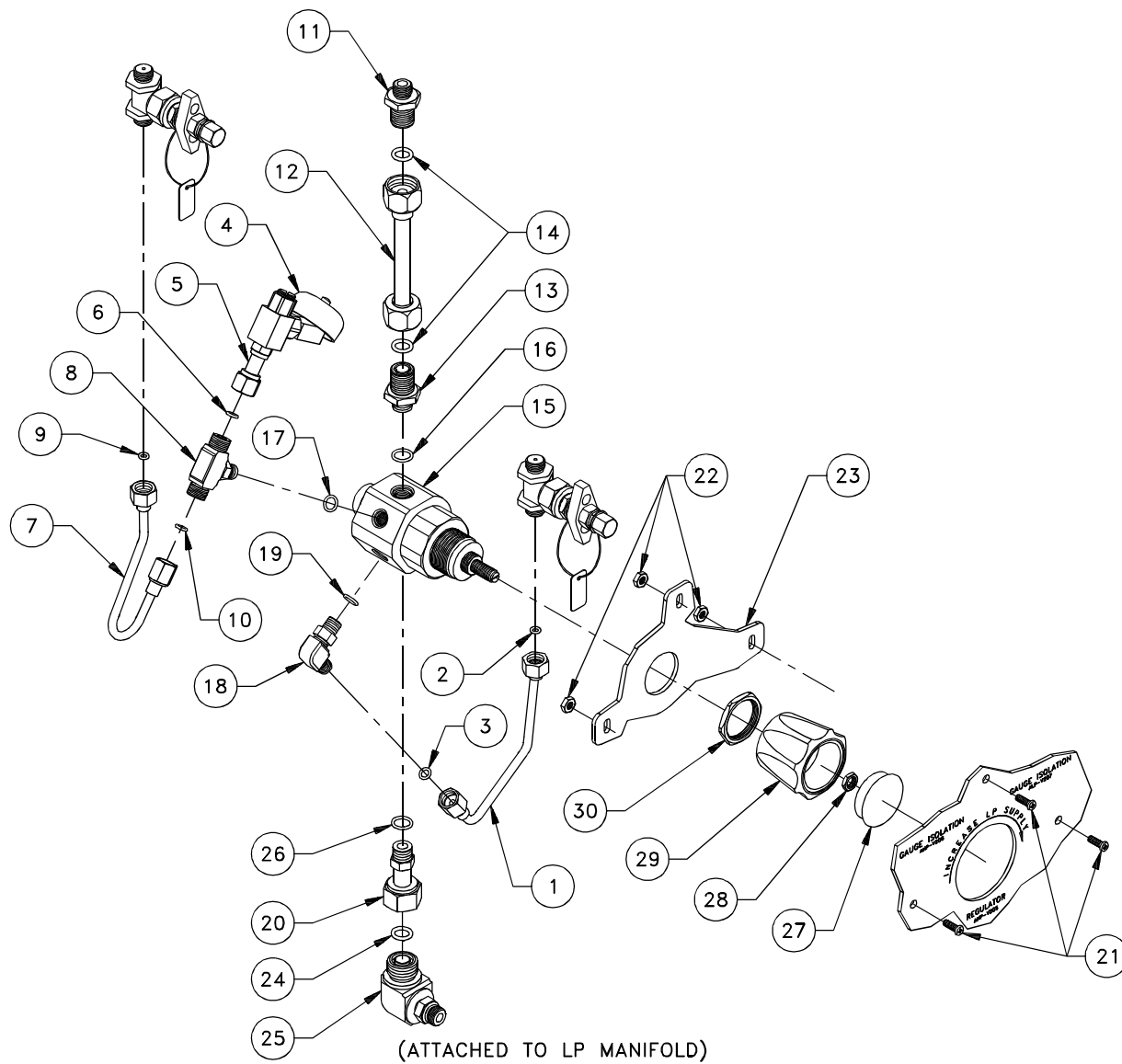


Figure 6-8. Regulator (AHP-V205)

### 6.5.2.10 LP Manifold Bleed Valve (ALP-V208) Removal and Replacement (Figure 6-9).

#### a. Tools, Parts, Materials, and Test Equipment.

- (1) Ratchet handle, 3/8" drive
- (2) 6" extension, 3/8" sq. drive
- (3) Parts: See Chapter 7 for part numbers and CAGE codes
- (4) Crowfoot, 11/16"
- (5) Silicone compound, MIL-S-8660

#### b. LP Manifold Bleed Valve Removal.

- (1) Place CPA on right side (face-up), if removed from PASP weldment.
- (2) Using 3/8" ratchet handle, 6" extension, and 11/16" crowfoot, loosen LP bleed valve (1).

- (3) Unscrew valve from manifold and remove.

- (4) Remove O-ring (2).

#### c. LP Manifold Bleed Valve Replacement.

- (1) Install O-ring (2) on bleed valve (1).
- (2) Screw valve into manifold and hand-tighten. Tighten using 3/8" ratchet handle, 6" extension, and 11/16" crowfoot.
- (3) Perform system tightness test IAW paragraph 6.5.2.2, modified as follows: Skip Step b.(13).
- (4) Install CPA in PASP IAW paragraph 6.5.2.1, if installation required.

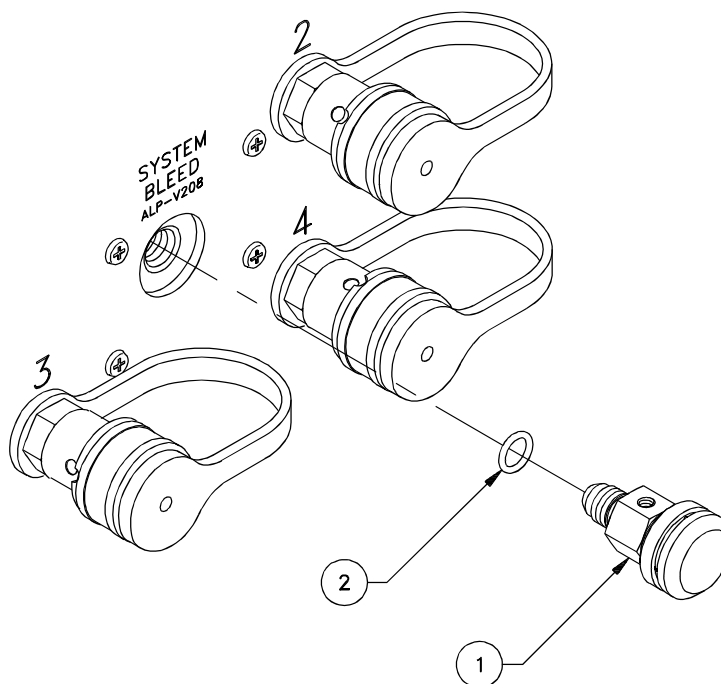


Figure 6-9. LP Manifold Bleed Valve (ALP-V208)

#### 6.5.2.11 LP Quick Disconnect (QD) Removal and Replacement (Figure 6-10).

a. Tools, Parts, Materials, and Test Equipment.

- (1) Ratchet handle, 3/8" drive
- (2) 6" extension, 3/8" sq. drive
- (3) Wrench, open-end, 3/4" (if CPA removed from PASP weldment)
- (4) Crowfoot, 3/4"
- (5) Parts: See Chapter 7 for part numbers and CAGE codes
- (6) Teflon® tape

b. LP QD Removal.

- (1) Place CPA on right side (face-up), if removed from PASP weldment.
- (2) Using 3/8" ratchet handle, 6" extension, and 3/4" crowfoot, loosen QD (1). A 3/4" wrench may be used where convenient, if CPA removed from PASP weldment.

#### **NOTE**

It is easiest to engage crowfoot or wrench on rounded body of QD; this may separate the body of the QD from the fitting that screws into the manifold. If this happens, remove outer half of QD, being careful not to lose internal spring. Use 3/4" wrench to loosen fitting that screws into LP manifold; remove by hand along with dust cap. Reconnect both halves of the QD.

- (3) Unscrew and remove QD fitting from manifold, along with dust cap (2).

c. LP QD Replacement.

**CAUTION**

Ensure all previously applied tape is removed from threads. Apply Teflon® tape to threaded QD by wrapping 1-1/2 turns in a CCW direction beginning at second thread. Do not wrap tape on first thread as pieces of tape can break off and reduce airflow.

- (1) Clean threads on QD (1). Apply Teflon® tape on threads.
- (2) Install dust cap (2).
- (3) Screw QD (1) into manifold; tighten with 3/8" ratchet handle, 6" extension, and 3/4" crowfoot. A 3/4" wrench may be used where convenient if CPA removed from PASP weldment.
- (4) Perform system tightness test IAW paragraph 6.5.2.2, modified as follows: Skip Step b.(13).
- (5) Install CPA in PASP IAW paragraph 6.5.2.1, if installation required.

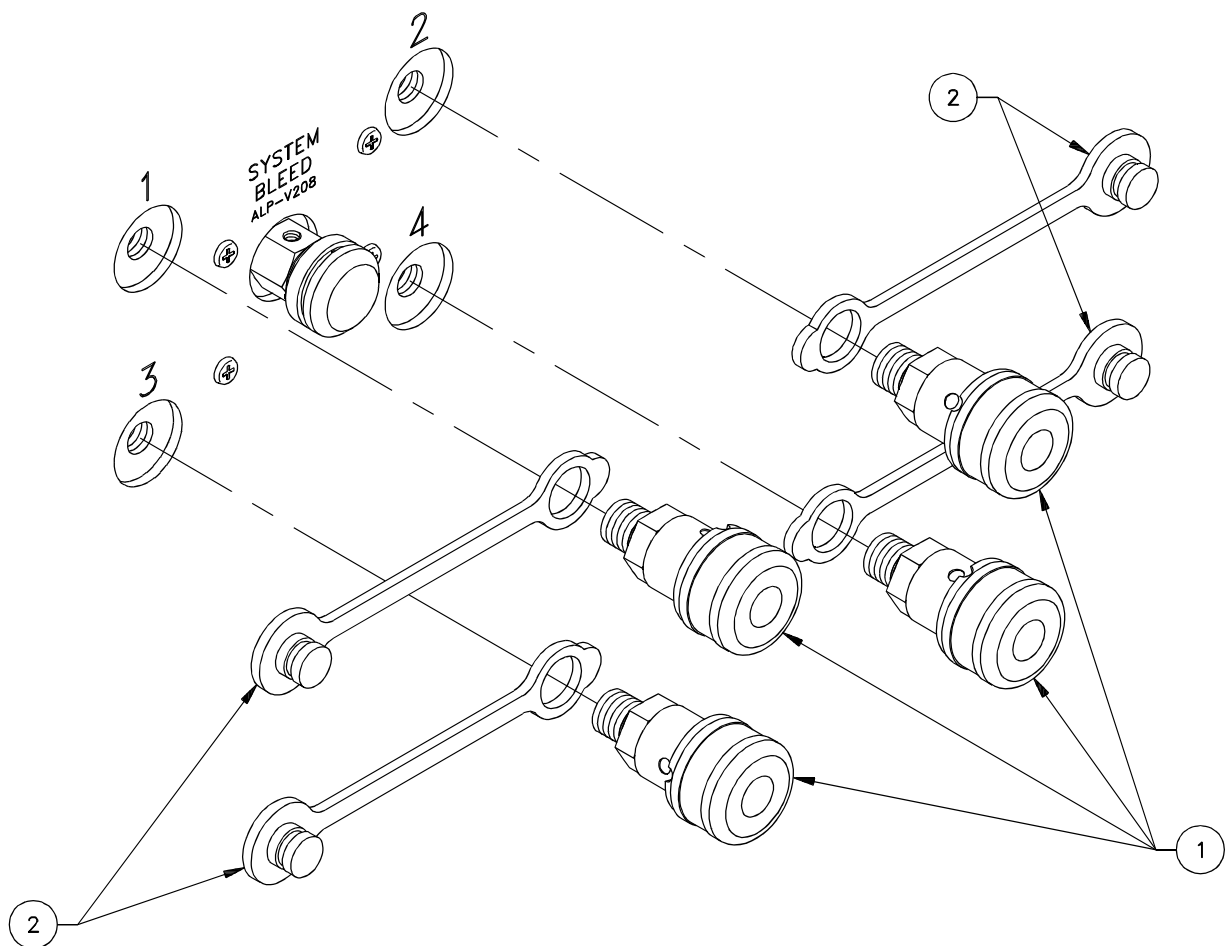


Figure 6-10. LP Quick Disconnects

### 6.5.2.12 LP Manifold Removal and Replacement (Figure 6-11).

#### a. Tools, Parts, Materials, and Test Equipment.

- (1) Screwdriver, cross-tip, #2
- (2) Wrench, open-end, 3/8"
- (3) Wrench, open-end, slim, 11/16"
- (4) Wrench, open-end, 7/8"
- (5) Wrench, open-end, 1"
- (6) Parts: See Chapter 7 for part numbers and CAGE codes
- (7) Silicone compound, MIL-S-8660

#### b. LP Manifold Removal.

- (1) Remove CPA IAW paragraph 6.5.2.1.
- (2) Remove LP manifold bleed valve IAW paragraph 6.5.2.10.
- (3) Remove four LP QDs IAW paragraph 6.5.2.11.
- (4) Using 11/16" wrench, loosen tube (1) nuts. Unscrew and remove tube (1); remove O-rings (2, 3).
- (5) Using 1" wrench, loosen connector (4) large nut and slide nut back on connector.
- (6) Using 7/8" wrench, loosen and remove plug (5); remove O-ring (6).
- (7) Using 11/16" wrench, loosen and remove two plugs (7); remove both O-rings (8).
- (8) Using 3/8" wrench to hold nuts (9), unscrew each of four screws (10) with #2 cross-tip screwdriver; remove screws and nuts.
- (9) Remove LP manifold (11) and gasket (12).
- (10) Using slim 11/16" wrench, loosen retaining nut on elbow (13); remove elbow; remove O-rings (14, 15).

#### c. LP Manifold Replacement.

- (1) Install O-rings (6, 8) onto plugs (5, 7), then screw plugs into manifold (11) and hand-tighten. Tighten two smaller plugs (7) with 11/16" wrench; tighten larger plug (5) with 7/8" wrench.

- (2) Ensure elbow (13) retaining nut is fully backed off of O-ring seating surface. Install O-ring (15) on elbow (13); screw elbow completely into manifold and hand-tighten retaining nut. Orient elbow parallel to short side of manifold.
- (3) Insert two of the four screws (10) diagonal from one another through front of CPA and install gasket (12).
- (4) Install O-ring (14) in elbow (13).
- (5) Ensure connector (4) large nut is pushed up against the connector small nut.
- (6) Install LP manifold (11), carefully pushing two installed screws through manifold, being careful not to damage O-ring (14) in elbow.
- (7) Install nuts (9) on installed screws (10) and hand-tighten. Install two remaining screws and nuts, and hand-tighten.
- (8) Screw connector (4) large nut onto elbow (13) and hand-tighten.
- (9) Using 3/8" wrench and #2 cross-tip screwdriver, tighten four screws (10) and nuts (9).
- (10) Tighten connector (4) large nut with 1" wrench.
- (11) Install O-rings (2, 3) on tube (1). Install tube (1) between elbow and LP gauge isolation valve. Tighten tube (1) nuts with 11/16" wrench.
- (12) Using slim 11/16" wrench, tighten elbow (13) retaining nut.
- (13) Install four LP QDs IAW paragraph 6.5.2.11, modified as follows: Skip Steps c.(4) and c.(5).
- (14) Install LP manifold bleed valve IAW paragraph 6.5.2.10, modified as follows: Skip Steps c.(3) and c.(4).
- (15) Perform system tightness test IAW paragraph 6.5.2.2, modified as follows: Skip Step c.(13).
- (16) Install CPA in PASP IAW paragraph 6.5.2.1.



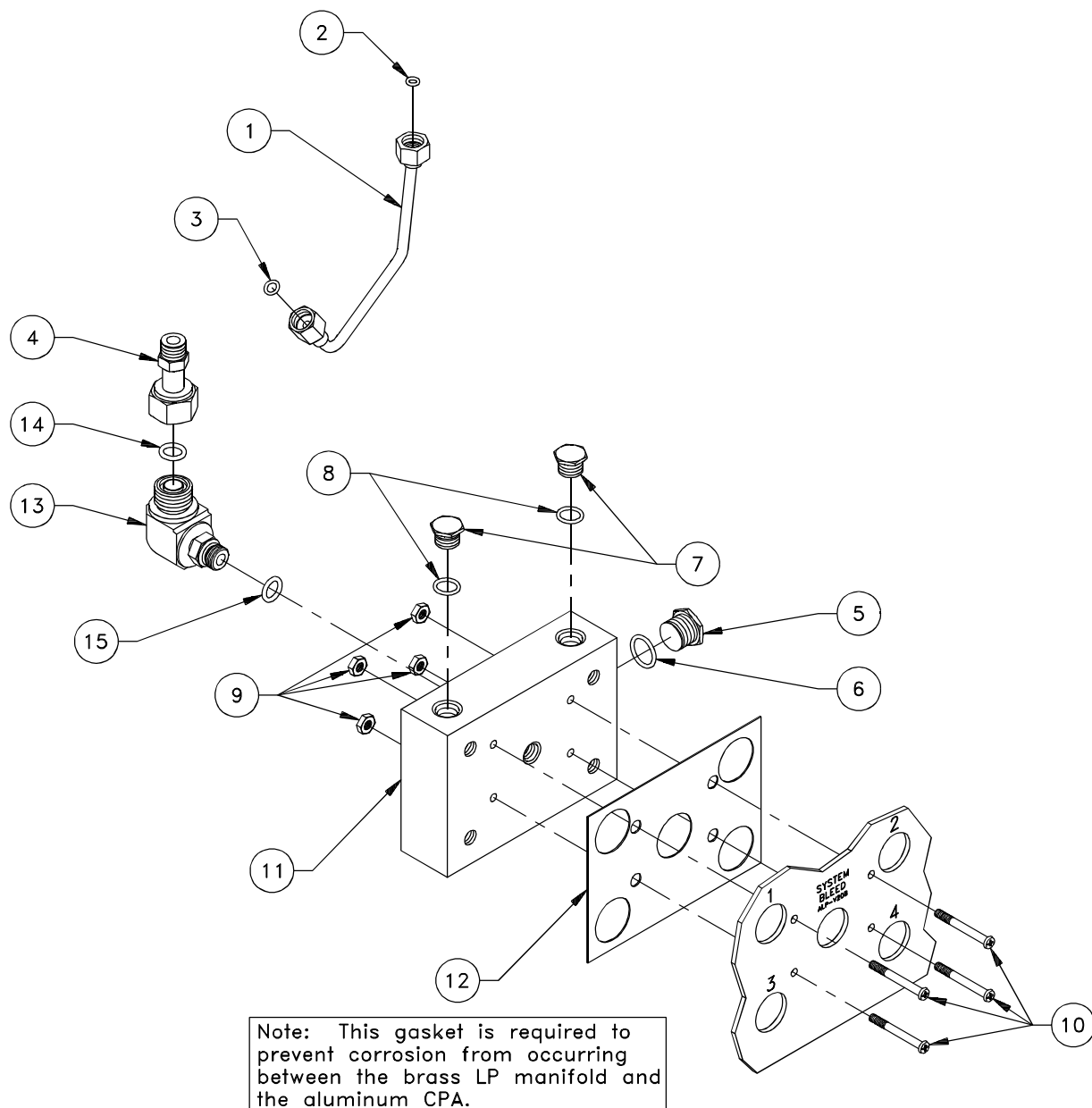


Figure 6-11. LP Manifold

### 6.5.3 HP Air Hose Assembly.

#### 6.5.3.1 Nipple and/or O-Ring Removal and Replacement (Figure 6-12).

##### a. Tools, Parts, Materials, and Test Equipment.

- (1) Wrench, open-end, 11/16"
- (2) Wrench, open-end, 3/4"
- (3) Wrench, open-end, 15/16"
- (4) Wrench, open-end, 1"
- (5) O-ring removal tool
- (6) Parts: See Chapter 7 for part numbers and CAGE codes
- (7) Teflon® tape
- (8) Silicone compound, MIL-S-8660

##### b. Nipple/O-ring Removal.

- (1) To remove nipple, hold tee (1) with 3/4" wrench. Slide hand nut (2) back from end of fitting and, using 11/16" wrench, loosen nipple (3).
- (2) Remove nipple (3) and O-ring (4). Use O-ring removal tool.

##### c. Nipple/O-ring Replacement.

- (1) Ensure threads are clean and apply Teflon® tape to threads.
- (2) Reinstall hand nut (2) back over inner portion of fitting and thread nipple (3) into tee hand-tight. Hold tee with 3/4" wrench and tighten nut using 11/16" wrench.
- (3) Install O-ring (4).
- (4) Perform HP air hose tightness test IAW paragraph 6.5.3.5.

#### 6.5.3.2 Bleed Valve Removal and Replacement (Figure 6-12).

##### a. Tools, Parts, Materials, and Test Equipment.

- (1) Wrench, open-end, 11/16"
- (2) Parts: See Chapter 7 for part numbers and CAGE codes
- (3) Silicone compound, MIL-S-8660

##### b. Bleed Valve Removal.

- (1) Place tee (1) in vise or hold firmly on work table.

- (2) Loosen bleed valve (5) with 11/16" wrench. Unscrew valve; remove O-ring (6).

##### c. Bleed Valve Replacement.

- (1) Install O-ring (6).
- (2) Screw valve (5) into tee (1) hand-tight; place tee in vise or hold firmly and tighten bleed valve with 11/16" wrench.
- (3) Perform HP air hose tightness test IAW paragraph 6.5.3.5.

#### 6.5.3.3 Air Hose Removal and Replacement (Figures 6-12 and 6-13).

##### a. Tools, Parts, Materials, and Test Equipment.

- (1) Wrench, open-end, 11/16"
- (2) Wrench, open-end, 3/4"
- (3) Wrench, open-end, 15/16"
- (4) Wrench, open-end, 1"
- (5) Leak-test solution, MIL-L-25567
- (6) Parts: See Chapter 7 for part numbers and CAGE codes
- (7) Silicone compound, MIL-S-8660

##### b. Air Hose Assembly/HP Air Hose Removal.

### NOTE

Refer to Figure 6-13 for Steps b.(1) through b. (5).

- (1) Remove CPA IAW paragraph 6.5.2.1.
- (2) Place CPA face down with three-way ball valve (1) facing the front of work table.
- (3) Holding connector (4) with 15/16" open-end wrench, loosen tubing (5) nut with 1" wrench.
- (4) Holding connector (6) with 15/16" wrench, loosen tubing (5) nut with 1" wrench. Remove tubing (5). Remove both O-rings (7, 8). Remove HP air hose assembly wire rope lanyard.
- (5) Using 11/16" wrench, remove HP air hose assembly (2); remove O-ring (3).

### NOTE

Refer to Figure 6-12 for Steps b.(6) through b.(8).

- (6) Place tee (1) in vise or hold firmly with 3/4" wrench.
- (7) Loosen nut swivel fitting (7) with 11/16" wrench.
- (8) Remove hose (8) with lanyard from tee. Remove O-ring (9).

c. Air Hose Replacement.

**NOTE**

Ensure new hose inspected and hydrostatically tested IAW MRCs 5519 A-2R and R-1.

**NOTE**

Refer to Figure 6-12 for Steps c.(1) through c.(3) below.

- (1) Install O-ring (9) on tee (1).
- (2) Screw hose fitting (7) onto tee (1) and hand-tighten.
- (3) Place tee (1) in vise or hold with 3/4" wrench; tighten fitting (7) with 11/16" wrench.

**NOTE**

Refer to Figure 6-13 for Steps c.(4) through c.(8).

- (4) Feed wire rope lanyard (17) from HP air hose assembly (2) through the control panel elbow hole. Place loop around connector (4).
- (5) Install new O-ring (3) on elbow (11).
- (6) Install HP air hose (2) on elbow (11); tighten using 11/16" wrench.
- (7) Install O-rings (7, 8) on connectors (4, 6). Carefully fit tube (5) between connectors (4, 6) and hand-tighten two tube nuts. Hold connector (4) with 15/16" wrench and tighten tube upper nut with 1" wrench; hold connector (6) with 15/16" wrench and tighten tube lower nut with 1" wrench.
- (8) Perform HP air hose system tightness test IAW paragraph 6.5.3.5. Use a brush to wipe leak-test solution over connections of HP air hose assembly during test.
- (9) Reinstall CPA IAW paragraph 6.5.2.1.

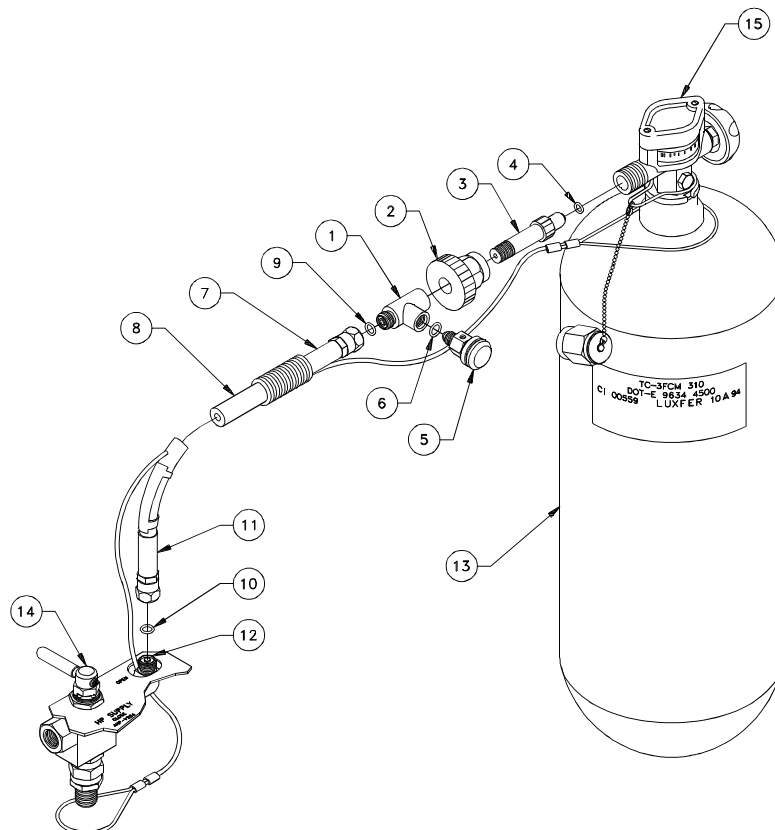


Figure 6-12. HP Air Hose Assembly

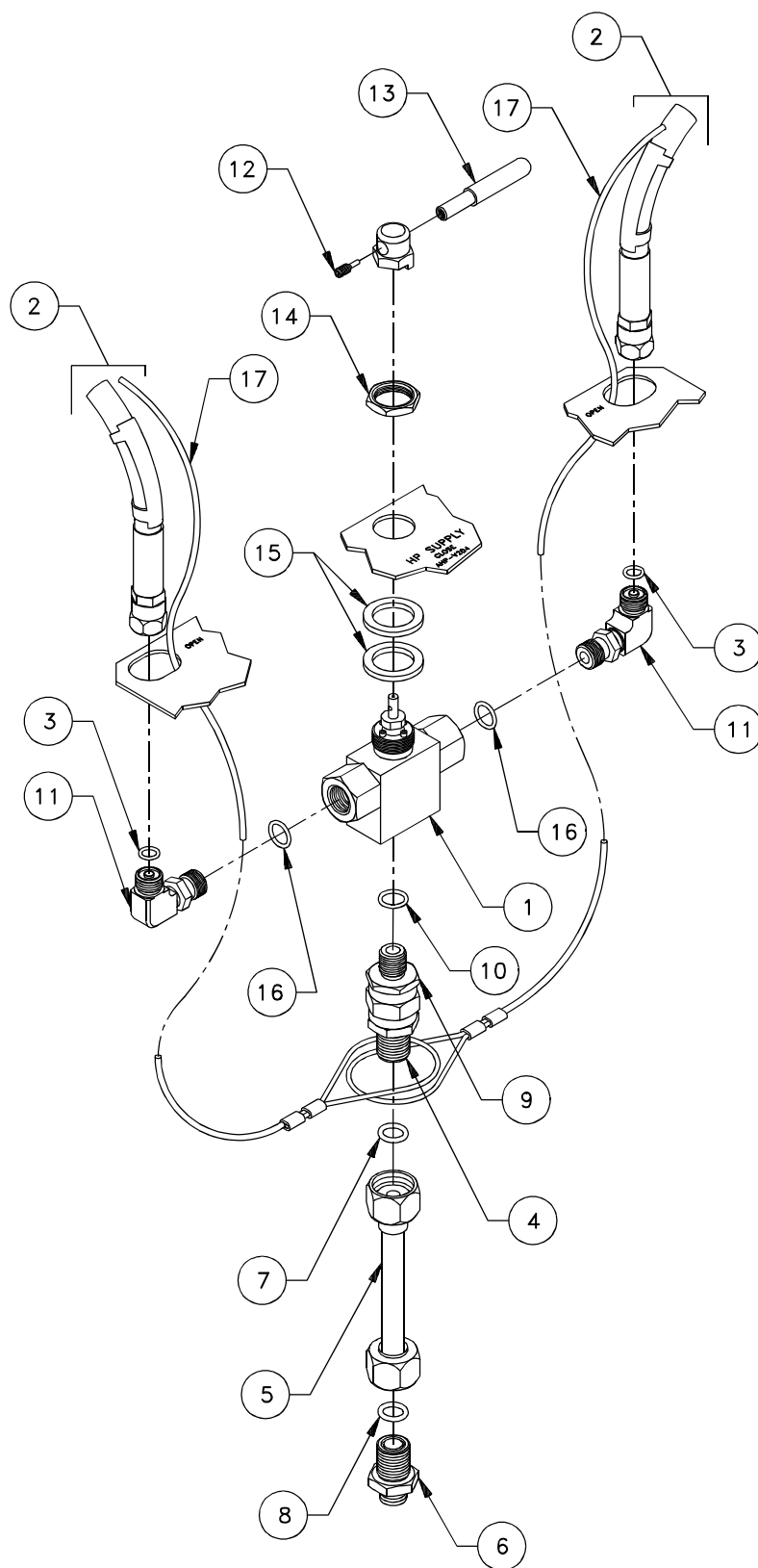


Figure 6-13. Three-Way Ball Valve (AHP-V204)

**6.5.3.4 Lanyard Replacement.** The HP air hose is equipped with a lanyard that must be installed for safety (in case the hose ruptures). The lanyard is fabricated and installed IAW drawing no. 6314576 and should be replaced IAW this drawing. Do not substitute nylon tie wraps or any other material to attach lanyard to hose.

To replace lanyard, first perform the steps in paragraph 6.5.3.3 to remove HP air hose assembly. Replace lanyard IAW the drawing specified above. Reinstall the HP air hose assembly IAW paragraph 6.5.3.3.

#### 6.5.3.5 HP Air Hose Tightness Test (Figure 6-14).

##### a. Tools, Parts, Materials, and Test Equipment.

- (1) Wrench, open-end, 11/16"
- (2) Parts: See Chapter 7 for part numbers and CAGE codes
- (3) Leak-test solution, MIL-L-25567
- (4) Silicone compound, MIL-S-8660

##### b. Test Procedure.

- (1) Connect PASP HP air hose assembly (1) to be tested to HP air cylinder (2). The cylinder must be fully charged to 4,500 psig.
- (2) Ensure HP air cylinder valves ((AHP-V201) (3), (AHP-V301) (4), or (AHP-V302) (5)) is shut.
- (3) Align the following PASP valves as follows:
  - (a) Three-way ball valve (AHP-V204) (6): closed
  - (b) HP gauge isolation valve (AHP-V206) (7): ensure open
  - (c) LP gauge isolation valve (ALP-V207) (8): ensure open
  - (d) Regulator valve (AHP-V205) (9): fully CCW

**WARNING**

HP air leaking from HP air hose assembly can cause severe cuts to skin or cause debris to enter body. DO NOT check for leaks by passing hands or other parts of body over pressurized components. Failure to observe this warning could cause serious injury.

- (4) Slowly open HP air cylinder valve ((AHP-V201) (3), (AHP-V301) (4), or (AHP-V302) (5)) on fully charged HP air cylinder (2).

- (5) Slowly position three-way ball valve (AHP-V204) (6) toward pressurized HP air cylinder. Shut HP air cylinder valve ((AHP-V201) (3), (AHP-V301) (4), or (AHP-V302) (5)).
- (6) Note HP gauge (AHP-G201) (10) reading.
- (7) Wait 10 minutes.

#### NOTE

Check for leaks by using brush to wipe leak-test solution over connections of PASP and HP air hose fittings during test.

- (8) Note pressure on HP gauge (AHP-G201) (10).
- (9) If no difference between initial reading and 10 minute reading exists, test is complete (system is not leaking). If there is a difference in readings, perform leak diagnostic test IAW paragraph 6.5.2.3.
- (10) Close three-way ball valve (AHP-V204) (6). Bleed down HP air hose assembly (1) using bleed valve ((AHP-V202) (12) or (AHP-V203) (13)).
- (11) If second HP air hose assembly was removed, disconnect first tested HP air hose assembly (1) from HP air cylinder valve and connect second hose assembly to cylinder valve. Repeat Steps b.(5) through b.(10).
- (12) Bleed down PASP using bleed valve ((AHP-V202) (12) or (AHP-V203) (13)).
- (13) Position three-way ball valve (AHP-V204) (6) to shut position.
- (14) Leave gauge isolation valves ((AHP-V206) (7) and (ALP-V207) (8)) open.

**6.5.4 PASP Case Assembly.** PASP case assembly repairs should restore the components to the configuration reflected in the following drawings:

PASP Case Assembly: 53711ASSY6314766  
 Components: 53711ASSY6314758, Rev B  
 PASP Shell Weldment: 53711ASSY6314754, Rev B

#### 6.6 RASP CORRECTIVE MAINTENANCE.

Refer to paragraph 6.5.1 and Chapter 8 for cylinder repair information. RASP weldment or case assembly repairs should restore the components to the configuration reflected in the following drawings:

RASP Case Assembly: 53711ASSY6314767  
 RASP Label: 53711ASSY6314769  
 Components: 53711ASSY6314758, Rev B  
 RASP Shell Weldment: 53711ASSY6314755

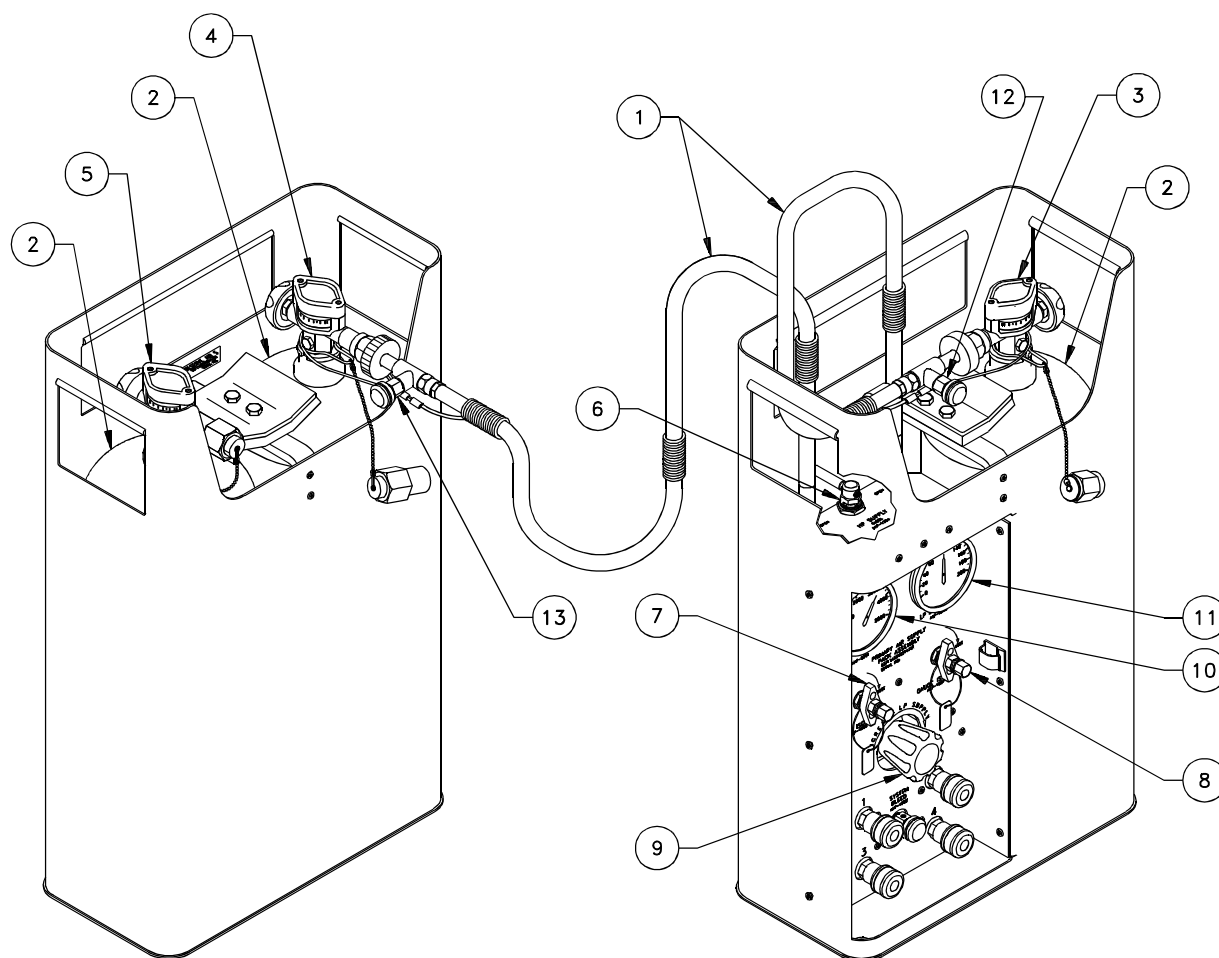


Figure 6-14. HP Air Hose Tightness Test

## 6.7 SCBA CORRECTIVE MAINTENANCE.

### WARNING

Do not tighten fittings or connectors when system is pressurized. Failure to follow this warning could result in serious injury or death.

Inspect SCBA regulators regularly and maintain according to the manufacturer's instructions. Regulator repairs must only be made by properly trained personnel. Failure to follow these instructions could result in serious injury or death.

Never alter or modify this device, except as directed by MSA during installation of NIOSH/MSHA-approved kits. Use only MSA or Navy-approved replacement parts. If other than approved parts are used, NIOSH/MSHA approval will be voided. Failure to follow these instructions could result in serious injury or death.

### CAUTION

Do not attempt repairs beyond those specified in this manual. Only trained or certified personnel authorized by MSA are permitted to maintain and repair the PremAire® CADET 15M Respirator. The respirator must not be repaired beyond manufacturer's recommendations. Title 29 CFR Part 1910.134, Paragraph (f) (4) makes these requirements clear.

For the SCBA to function properly, correct maintenance and repair procedures must be followed. As parts of the PremAire® CADET 15M Respirator show signs of wear, they must be replaced immediately. Only MSA parts or their equivalent, designed for use with this equipment, shall be used for repairs or maintenance. Most parts for the PremAire® CADET 15M Respirator are not interchangeable with similar devices produced by other manufacturers.

Limited repairs at the user level are authorized on the SCBA. These repairs are set forth in this chapter and are classified as Level 1 repairs in the PremAire® CADET 15M Air-Line Respirator Operation and Maintenance

Manual. Though no special training is required to perform authorized (Level 1) repairs, personnel must have a thorough knowledge of the equipment prior to initiating any repairs. Repairs beyond those described here shall be performed by the manufacturer's authorized repair facility. These repairs are referred to as Level II and Level III maintenance in the manufacturer's manual. Only trained respirator repair personnel are authorized to perform Level II or Level III repairs and servicing. These repairs include SCBA respirator problems, as well as repairs to the LP and HP pressure areas. Authorized repairs at the user level (Level I) are described below.

### 6.7.1 Facepiece Test.

#### WARNING

A functional facepiece test must be conducted after any repair to facepiece. Failure to follow this warning could cause injury or death.

- a. Tools, Parts, Materials, and Test Equipment. None.
- b. Facepiece Test. To perform the facepiece test after repairs, don facepiece and check face-to-facepiece seals as follows:
  - (1) Remove regulator from facepiece.
  - (2) Place one hand over facepiece inlet.
  - (3) Inhale and hold breath for 10 seconds.
  - (4) The facepiece should collapse toward your face and stay there until you exhale or remove your hand, allowing air to enter.
- c. Leaks. If a leak is detected, locate cause, repair, and repeat each step before using the facepiece.

### 6.7.2 Facepiece Rubber Head Harness Removal and Replacement (Figure 6-15).

- a. Tools, Parts, Materials, and Test Equipment. Parts: See Chapter 7 for part numbers and CAGE codes.
- b. Head Harness Removal.
  - (1) Place facepiece on a clean table or other flat surface.
  - (2) Pull back of each buckle (2) away from head harness (1) and pull slightly so head harness end tab (3) is at buckle (2).

- (3) Fold end tab (3) sides together, then pull each end tab (3) through its buckles (2).

c. Head Harness Replacement.

- (1) Place new head harness (1) flat with MSA logo facing up.
- (2) Pick head harness (1) up by strap labeled "FRONT." Insert strap into buckle at top of

mask. Strap should pass between wire roller and buckle clamp.

- (3) Pull wire roller down against the strap.

- (4) Refold end tab (3) and push it through the buckle (2) again, this time passing over wire roller.

- (5) Repeat previous steps for each remaining strap.

- (6) Check that installed head straps are not twisted.

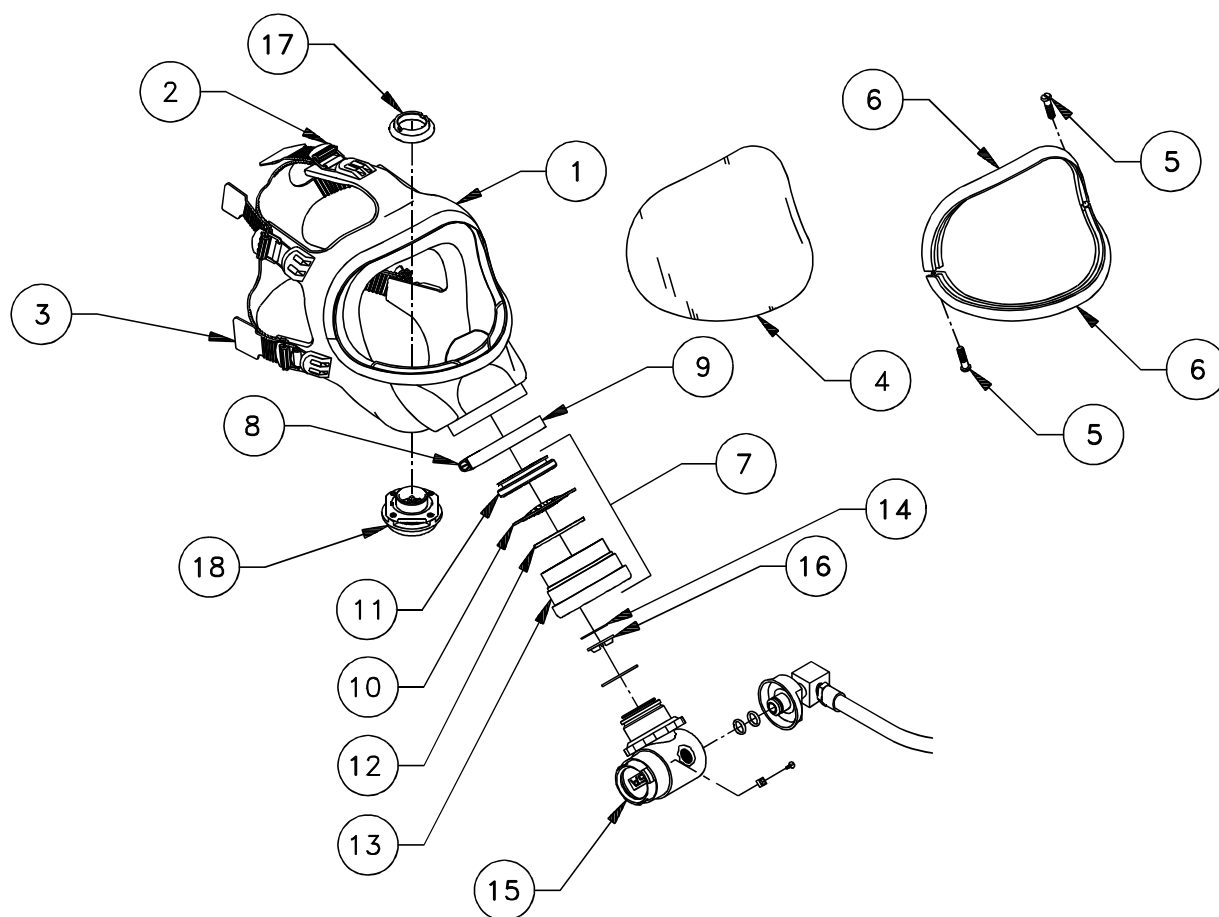


Figure 6-15. Facepiece and Components



### 6.7.3 Facepiece Lens and Ring Removal and Replacement (Figure 6-15).

**CAUTION****CAUTION**

Protective papers on new lens should not be taken off until lens installed in facepiece.

- a. Tools, Parts, Materials, and Test Equipment.
  - (1) Screwdriver, flat-tip, 1/8"
  - (2) Parts: See Chapter 7 for part numbers and CAGE codes.
- b. Facepiece Lens and Ring Removal.
  - (1) Loosen and remove the screw (5) from each side of facepiece lens retaining ring (6) with 1/8" flat-tip screwdriver.
  - (2) Remove two retaining ring (6) halves.
  - (3) Fold facepiece flange back and pull lens (4) out of groove.
- c. Facepiece Lens and Ring Replacement.
  - (1) Remove dirt, lens fragments or other debris from groove. Align lens centerline marks (top and bottom) with facepiece centerline mark, then insert lens (4) into groove.
  - (2) Work facepiece rubber flange around lens (4) to fully seat lens (4) in the groove.
  - (3) Align lens retaining ring (6) centerline with facepiece rubber flange centerline mark.
  - (4) Press ring (6) in place. Mount other ring (6) half in the same way.
  - (5) Press ring (6) halves together at the top and bottom of facepiece so that ends mate.
  - (6) Install screw (5) on each side of retaining ring (6) halves.
  - (7) Start screws (5); they should thread easily. If not, remove and reinstall screws to avoid cross-threading. Maintain hand-pressure on both ring (6) halves.

Do not overtighten screws (5). Rubber must not show between lens ring ends at the joint. If a gap occurs, reassemble.

- (8) As ring (6) halves come together, alternate tightening left and right screws (5) to be sure ring seats thoroughly on rubber flange.
- (9) Remove all lens protective papers from new lens.
- (10) Don facepiece and check face-to-facepiece seal following procedures outlined in paragraph 6.7.1.
- (11) Install cover lens to protect facepiece polycarbonate lens during storage.

**CAUTION**

Do not use cover lens in high temperature environment, such as fire-fighting. High temperature may distort cover lens, or moisture trapped between cover lens and facepiece lens may condense and distort vision. Always remove cover lens before donning facepiece.

### 6.7.4 Inlet Assembly and Speaking Diaphragm Removal and Replacement (Figure 6-15).

- a. Tools, Parts, Materials, and Test Equipment.
  - (1) Screwdriver, flat-tip, 1/8"
  - (2) Pressure-demand exhalation wrench (spanner wrench), (special tool, MSA part no. 461828)
  - (3) Parts: See Chapter 7 for part numbers and CAGE codes.
- b. Inlet Assembly Removal.
  - (1) Loosen screw (8) on the band clamp (9).
  - (2) Remove clamp (9) and pull inlet assembly (7) out of facepiece.
- c. Inlet Assembly Replacement.
  - (1) Slide band clamp (9) on facepiece. Slide inlet assembly (7) into facepiece. Check that air ducts in housing assembly are lined up with ducts in facepiece.

- (2) Ensure inlet assembly (7) is pressed completely into facepiece.
- (3) Band clamp (9) must be positioned so that screw (8) is at the 5 or 7 o'clock position. Screw head must be positioned to left so that it will not rub facepiece rubber.
- (4) Tighten band clamp (9) until inlet assembly (7) is fixed. Be sure that band clamp does not pull facepiece rubber away from assembly. Do not overtighten. If facepiece rubber "bulges" out through slots in the clamp (9), clamp (9) is too tight and must be loosened and retightened.
- (5) Don facepiece and check face-to-facepiece seal following the procedures outlined paragraph 6.7.1.

d. Speaking Diaphragm Removal.

- (1) Unscrew retainer ring (11) using spanner wrench.
- (2) Turn inlet assembly (7) upside down and shake out metal speaking diaphragm (10).
- (3) Check speaking diaphragm (10) for damage. Replace it if worn or damaged.
- (4) Check speaking diaphragm O-ring (12) (or gasket). Replace the O-ring (12), if either is worn or damaged.

e. Speaking Diaphragm Replacement.

- (1) Place O-ring (12) in groove of speaking diaphragm housing (13).
- (2) Place speaking diaphragm (10) in housing (13) so that outer lip rests on O-ring (12).
- (3) Be sure that crimped side of speaking diaphragm (10) is facing toward you.
- (4) Replace retainer ring (11) and tighten using spanner wrench.
- (5) Don the facepiece and check face-to-facepiece seal following the procedures outlined in paragraph 6.7.1.

**6.7.5 Facepiece Inhalation Disk Valve Removal and Replacement (Figure 6-15).**

a. Tools, Parts, Materials, and Test Equipment.

Parts: See Chapter 7 for part numbers and CAGE Codes.

b. Inhalation Disk Valve Removal.

- (1) Remove MMR (15) from facepiece.
- (2) Lift spider gasket (16) out of housing (13), using one of two tabs.
- (3) Remove valve disk (14) from speaking diaphragm housing (13). If you cannot grasp disk (14) with your fingers, use blunt object to lift one edge, then remove disk (14). Be careful not to tear soft disk (14).
- (4) Inspect disk (14) for tears or punctures. Disk (14) should be very soft and pliable. Install new disk (14) if it is damaged or hardened.

c. Inhalation Disk Valve Replacement.

- (1) Press valve disk (14) onto pin in speaking diaphragm housing (13).
- (2) Carefully tuck all edges of disk (14) under housing lip.
- (3) Replace spider gasket (16) (tabs up) and press it on pin. Work the groove into place to stabilize gasket (16).
- (4) Screw MMR (15) on facepiece.

**6.7.6 Facepiece Exhalation Valve Removal and Replacement (Figure 6-15).**

a. Tools, Parts, Materials, and Test Equipment.

- (1) Pressure-demand exhalation wrench (spanner wrench) (special tool, MSA part no. 461828)
- (2) Parts: See Chapter 7 for part numbers and CAGE codes.

b. Exhalation Valve Removal.

- (1) Fold chin cup away from exhalation valve (18) opening, then use spanner wrench to loosen valve retaining nut (17).
- (2) Unscrew retaining nut (17), then remove exhalation valve (18) from facepiece (1).

## c. Exhalation Valve Replacement.

- (1) Push exhalation valve (18) through opening in facepiece, positioning valve so that the MSA logo is right side up with respect to the facepiece. Ensure facepiece is flush with flat portion of valve so that all valve inlet threads fully protrude through rubber.
- (2) Fold chin cup down and install exhalation valve retaining nut (17) on valve threads. Hand-tighten nut.
- (3) Use spanner wrench to tighten retaining nut (17).
- (4) Don the facepiece and check the face-to-facepiece seal following the procedures outlined in paragraph 6.7.1.

## 6.7.7 LP Hose Assembly Repair (Figure 6-16).

CAUTION

Ensure all previously applied tape is removed from threads. Apply Teflon® tape to threaded fitting by wrapping 1-1/2 turns of tape in a clockwise direction beginning at second thread. Do not wrap tape on first thread as pieces of tape can break off and reduce air-flow to respirator.

**NOTE**

Leaks in LP hose can be repaired by re-tightening fittings, disassembling fittings and replacing sealing tape, or replacing parts.

## a. Tools, Parts, Materials, and Test Equipment.

- (1) Wrench, open-end, 7/16"
- (2) Wrench, open-end, 5/8"
- (3) Wrench, open-end, 9/16"
- (4) Wrench, open-end, 3/4"
- (5) Teflon® tape
- (6) Parts: See Chapter 7 for part numbers and Cage codes
- (7) Leak-test solution, MIL-L-25567

## b. Hose Leak Repair.

- (1) Use 7/16" open-end wrench to hold hose fitting and 5/8" open-end wrench on the swivel block to tighten plug (1)

**NOTE**

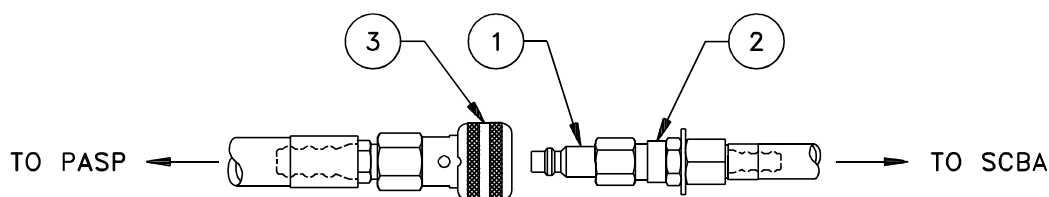
If the previous step does not correct the leak, disassemble fitting, reapply Teflon® tape, and reassemble.

- (2) Check fittings for leaks IAW leak-test procedure in MRC 5519 M-1R.
- (3) A leak in check valve (2), or quick disconnect (3) can be corrected in same manner. Use 9/16" open-end wrench to hold hose fitting while holding quick disconnect (3) with 3/4" open-end wrench to tighten.

**NOTE**

If the previous step does not correct leak, disassemble fitting, reapply Teflon® tape, and reassemble.

- (4) Check plug (1), for leaks IAW leak-test procedure in MRC 5519 M-1R.



**Figure 6-16. LP Hose Assembly**

### 6.7.8 Mask-Mounted (Second-Stage) Regulator (MMR) Removal and Replacement (Figure 6-15).

**CAUTION**

a. Tools, Parts, Materials, and Test Equipment.

- (1) O-ring removal tool
- (2) 1" wrench
- (3) Tweezers
- (4) Christo-Lube® lubricant, MIL-G-27617
- (5) Parts: See Chapter 7 for part numbers and CAGE codes

b. MMR Removal.

**WARNING**

Disconnect MMR from system prior to this procedure. Do not replace MMR if system under pressure. Failure to observe this warning could cause injury or death.

- (1) Unthread MMR from front of facepiece.
- (2) Push nut (1) on MMR body to expose O-ring (2).

Be careful not to damage seat area or other areas of MMR during removal of O-ring.

- (3) Remove O-ring (2) with O-ring removal tool and inspect O-ring. If defective, obtain new O-ring.
- (4) Using 1" wrench, remove MMR inlet hose swivel block (3). Inspect MMR inlet filter screen (4) for debris. If necessary, tap inlet port on table top to shake loose debris, taking care not to damage threads. Carefully use tweezers to remove any remaining debris, taking care not to puncture screen. MRC 5519 M-1R MR-3 pertains to cleaning screen.
- (5) Apply a thin film of Christo-Lube® lubricant to new O-ring (2) and stretch new O-ring (2) into the groove in MMR body.

c. MMR Replacement.

- (1) Replace flattened or damaged MMR swivel block O-rings (5). Use O-ring removal tool to remove O-rings for inspection. Lubricate O-rings then reinstall. Reassemble swivel block to MMR and tighten swivel block (3) with 1" wrench.

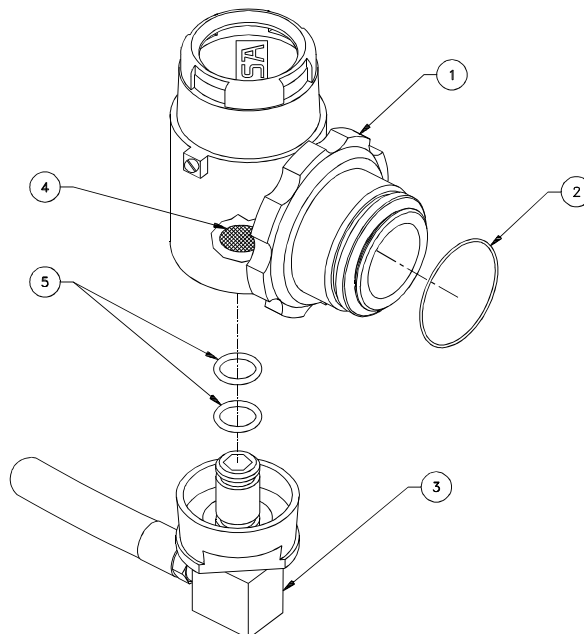


Figure 6-17. Mask-Mounted Regulator (MMR)